

XXXVII.—On three new Species of *Monticuliporoid* Corals.

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[Plate XII.]

1. *Monotrypa macropora*, Foord. (Pl. XII. figs. 1-1 d.)

Corallum discoid, concavo-convex, with expanding and gradually tapering margins; attached by the base to some foreign body, such as a shell or trilobite. Base covered with a thin and concentrically wrinkled epitheca. Cells opening upon the upper surface of the corallum. Calicinal surface almost smooth, with very slightly raised areas about 5 millimetres apart, occupied by groups of cells a little larger than the average. Of the larger cells about one to one and a half fill the space of 1 millimetre; of the smaller about two are comprised within the same limits. The largest specimen known to the writer measures about 7 centimetres in its greatest diameter and about 25 millimetres in thickness, from the centre of the surface to the base, measured vertically.

Microscopic characters.—In sections taken as near to the surface as possible the corallites are observed to be polygonal, mostly six-sided, with comparatively thin but remarkably clearly outlined walls, the original divisions of which may be faintly discerned under a moderately high power. Clusters of the larger cells are seen grouped together amongst those of the average size, while at rare intervals a few much smaller ones are intercalated with the former (fig. 1 b); but these are not of the nature of interstitial tubes, their tabulation not differing in any respect from that of the other corallites. Sections cut longitudinally to the axis of the corallites show that these are furnished with complete horizontal or slightly curved and very delicate tabulæ, which vary from about one half to two tube-diameters apart.

This species may be readily distinguished from the only one of the genus hitherto described from British rocks, viz. *Monotrypa crenulata*, Nicholson *, by its discoidal habit of growth, the large size of its corallites, its more abundant tabulæ, the total absence of crenulations in the tube-walls, and lastly by the presence of small angular corallites.

The writer is indebted to the kindness of Mr. George Maw,

* Ann. & Mag. Nat. Hist. ser. 5, vol. xiii. p. 124, fig. 2 (1884).

F.G.S., for a fine example of this species, from which the section figured on Pl. XII. fig. 1 *b* was prepared. The species appears to be not rare in the Buildwas beds (Wenlock shales), where they crop out on the east bank of the Severn near Buildwas Abbey. It is associated in these beds with a rich Brachiopodous fauna, which has been worked out by Messrs. Davidson and Maw*.

The two following species are contained in the collections of the British Museum (South Kensington), and the author has obtained Dr. Woodward's kind permission to describe them.

2. *Amplexopora* † *microstoma*, Foord.

Corallum lobato-palmate, with a tendency to become ramose in some places. Surface with irregular swellings. Corallites prismatic, extremely slender, nearly straight in the axial region, but bending slightly towards the surface. No monticules are present, but the surface shows under a hand-lens small clusters of cells somewhat larger than the average. Of these about three occupy the space of 1 millimetre, and about five of the smaller ones, so that the latter do not exceed $\frac{1}{125}$ inch in diameter. In rough fractures the walls of the cells are seen quite distinctly to be minutely crenulate, a character which occurs in so many species of the Monticuliporidae ‡ that its value for purposes of classification appears very questionable.

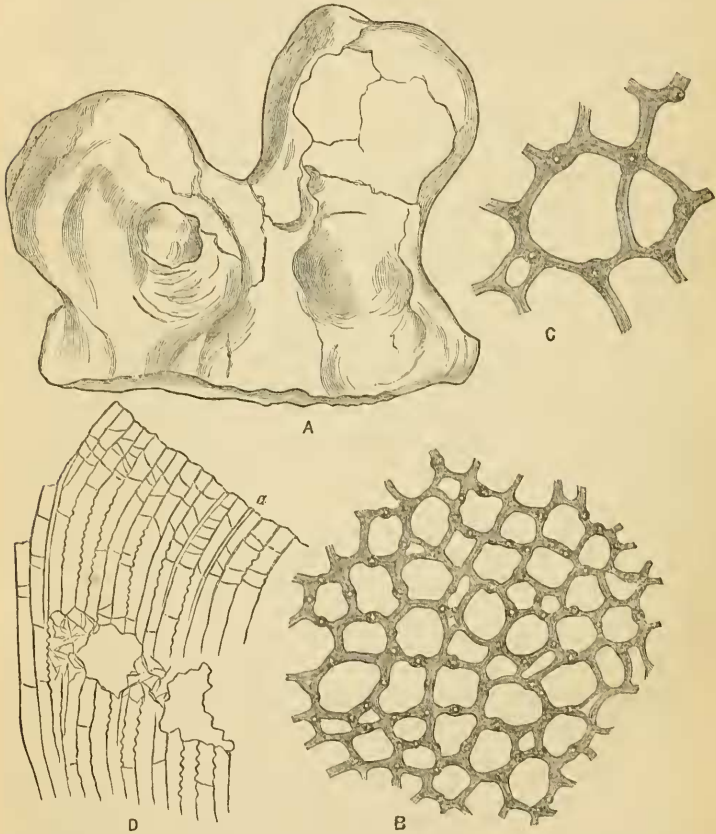
Microscopic characters.—Tangential sections show that the corallites are thin-walled, polygonal in outline, and very variable in size. The spiniform corallites are numerous and are observed at the angles of junction of the cell-walls, and frequently also in the substance of the walls between those angles. In this latter situation they give rise to an inflation of the walls of the cells. In longitudinal sections the tubes are seen to have thin walls, which are very slightly thickened

* *Vide* Geol. Mag. new series, decade ii. vol. viii. p. 100 (Feb. 1881).

† This genus is defined by E. O. Ulrich (Journ. Cincinnati Soc. Nat. Hist. vol. v. p. 154, 1882) for the reception of such forms of the Monticuliporidae as possess the following characters:—a ramose, free, or incrusting corallum, composed of cells of one kind only, the walls as seen in microscopic sections being thin in the axial but thicker in the peripheral region, and being provided with straight tabulae. Spiniform corallites are developed more or less abundantly in different species, to such an extent in some as to completely surround the cell-mouths. The geological range of the genus in the United States extends from the Cincinnati group (Caradoc) to the "Sub-" Carboniferous (Mountain Limestone).

‡ Crenulate walls are found in *Monotrypa undulata*, Nich., *M. crenulata*, Nich., *Heterotrypa Dawsoni*, Nich., and in the present species.

as they approach in a gentle curve the surface of the corallum. Very few tabulæ are developed in the axial region of the corallum, and it is not until the surface is nearly attained that they occur in greater numbers. Here they are placed at irregular distances apart, and are often sharply curved either upwards or downwards. The minute crenulations of the walls are seen in these sections (see woodcut, fig. D). The minute-



Amplexopora microstoma, Foord.—A. Corallum of this species of the natural size. B. Tangential section, enlarged about 30 diameters. C. Part of the same section, enlarged about 50 diameters. D. Longitudinal section, showing at *a* one of the spiniform corallites, enlarged about 15 diameters.

ness of the corallites separates this species from all others of the same genus known to the writer.

Formation and Locality. Wenlock Limestone, Dudley.

3. *Dekayella* * *robusta*, Foord. (Pl. XII. figs. 2-2 d.)

Corallum ramose, frequently branching. Branches thick, usually cylindrical or subcylindrical, sometimes compressed. Surface covered with small but tolerably conspicuous moniticules, situated about 3 millimetres apart, and bearing cells of a somewhat larger size than those in the intermediate spaces. The apertures of the corallites are polygonal in outline, and in places where the surface is well preserved some of the larger of the spiniform corallites may be seen with a hand-lens. Of the larger corallites about four occupy the space of 1 millimetre, of the smaller about five.

Microscopic characters.—Tangential sections reveal clearly the dimorphic character of the corallum, which is provided with two kinds of tubes, large and small; both are of polygonal form, and their outline is inflated in many places by the occurrence of numerous spiniform corallites. These also are of two kinds: the larger are usually situated at the angles formed by the junction of four or five cells, and fill a space quite as great as that occupied by some of the interstitial cells; the smaller are generally found to be in the substance of the cell-walls, about midway between two angles. The spiniform corallites form a very conspicuous feature in tangential sections of this species, and give to such sections a highly characteristic appearance. Under a moderately high power traces of the original walls of the corallites may be discerned in tangential sections; but as a rule this structure appears to have been destroyed in the process of fossilization. In longitudinal sections the two sets of tubes are clearly brought into view. In the larger ones there are numerous horizontal, sometimes slightly oblique, tabulæ, situated at from one half to one tube-diameter apart; they begin in the axial region of the corallum, and are about equally developed in their course from thence to the peripheral region. The smaller tubes do not differ in the character of their tabulation from the larger ones, except that the tabulæ in the former are a little more frequent than they are in the latter. There is a feature worthy of note in the structure of the walls of this species, and that is a periodic inflation, which reminds the

* Mr. E. O. Ulrich ("American Palæozoic Bryozoa," Journ. Cincinnati Soc. Nat. Hist. vol. v. p. 155, 1882) constituted this genus for the reception of forms "more nearly allied to *Dekayia*, Edwards and Haine, than to any other genus of the Monticuliporidae," but differing therefrom "in having the tube-walls in the mature region of the zoarium thicker, in having numerous interstitial tubes, and, instead of one, two distinct sets of spiniform tubuli" [= "spiniform corallites" of Nicholson]. This last is stated by Mr. Ulrich to be the most important character of the genus.

observer of a similar structure characteristic of the genus *Stenopora* (Lonsdale). Mr. Ulrich draws attention to a like feature in his description of a Cincinnati-group species of *Dekayella*—*D. obscura*, Ulrich (Journ. Cincinnati Soc. Nat. Hist. vol. vi. p. 150).

On leaving the axial region the tubes rapidly thicken towards the surface, the spiniform corallites being seen at frequent intervals piercing the corallum and intermingling with the ordinary corallites. The spiniform corallites appear to originate in the axial region of the corallum, as they may be seen in sections cut as deeply as it is possible to make them without destroying the walls of the tubes.

It may be well here to enumerate the chief characters which separate this species from the only two known to the writer, viz. *Dekayella Ulrichii*, Nicholson*, and *D. obscura*, Ulrich—both from the Cincinnati Group of Ohio. From the former of these the present type may be distinguished as follows:—by its much more robust habit of growth, by the possession of monticules, and by the much greater number of its tabulæ and spiniform corallites. The exceedingly small and delicate corallum of *D. obscura*, Ulrich, would be sufficient alone to differentiate it from *D. robusta*, and added to this the great development of the tabulæ and spiniform corallites in the latter make the distinction between the two forms sufficiently clear.

Formation and Locality. Cincinnati Group, Cincinnati, Ohio.

EXPLANATION OF PLATE XII.

- Fig. 1. Monotrypa macropora*, Foord: upper surface of corallum. Nat. size.
- Fig. 1 a.* Side view of the same specimen.
- Fig. 1 b.* Tangential section of this species, enlarged about 20 diameters.
- Fig. 1 c.* A few cells, enlarged about 50 diameters.
- Fig. 1 d.* Longitudinal section, enlarged about 15 diameters.
- Fig. 2. Dekayella robusta*, Foord: corallum, showing monticules. Nat. size.
- Fig. 2 a.* Tangential section of this species, showing the two series of spiniform corallites *a, a*. Enlarged about 30 diameters.
- Fig. 2 b.* Two cells, enlarged about 50 diameters.
- Fig. 2 c.* Longitudinal section, showing at *a* one of the spiniform corallites. Enlarged about 20 diameters.
- Fig. 2 d.* Portion of the same, showing more clearly the periodic inflation of the walls of the tubes. Enlarged about 50 diameters.

* = *Monticulipora (Heterotrypa) Ulrichii*, Nicholson ('The Genus *Monticulipora*,' Nicholson, p. 131, fig. 22, 1881).